Mentoring in Open Source Community. A Case Study of OpenStack Ecosystem

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Introduction

- This presentations aims at addressing the importance of open source community projects within universities and research facilities. A case study based on 2-years observation of OpenStack ecosystem at Ecole Polytechnique Montreal – with an average size of 300 students per semester taking the course.
- OpenStack has become a key player in open-source community including private and public cloud across Universities and Research facilities [KPB+13].
- Organizational involvement with open source ecosystems has become commonplace. Open source projects are fast becoming widely accepted and utilized form of innovation and product development. [RGBC+14], [Lin17], [PBOP07] [GAW+13], [TML14].

Context

Problematic

- Under-graduate students in software engineering are asked to choose any open source project of their choice. These course are offered twice a year, and for the past two years, we have maintained this requirement; asking students to choose any open source project. In a team of four to six students, they study the projects, customize it and make local changes and if necessary commit these changes to the remote repository; pull request.

Open Source Projects

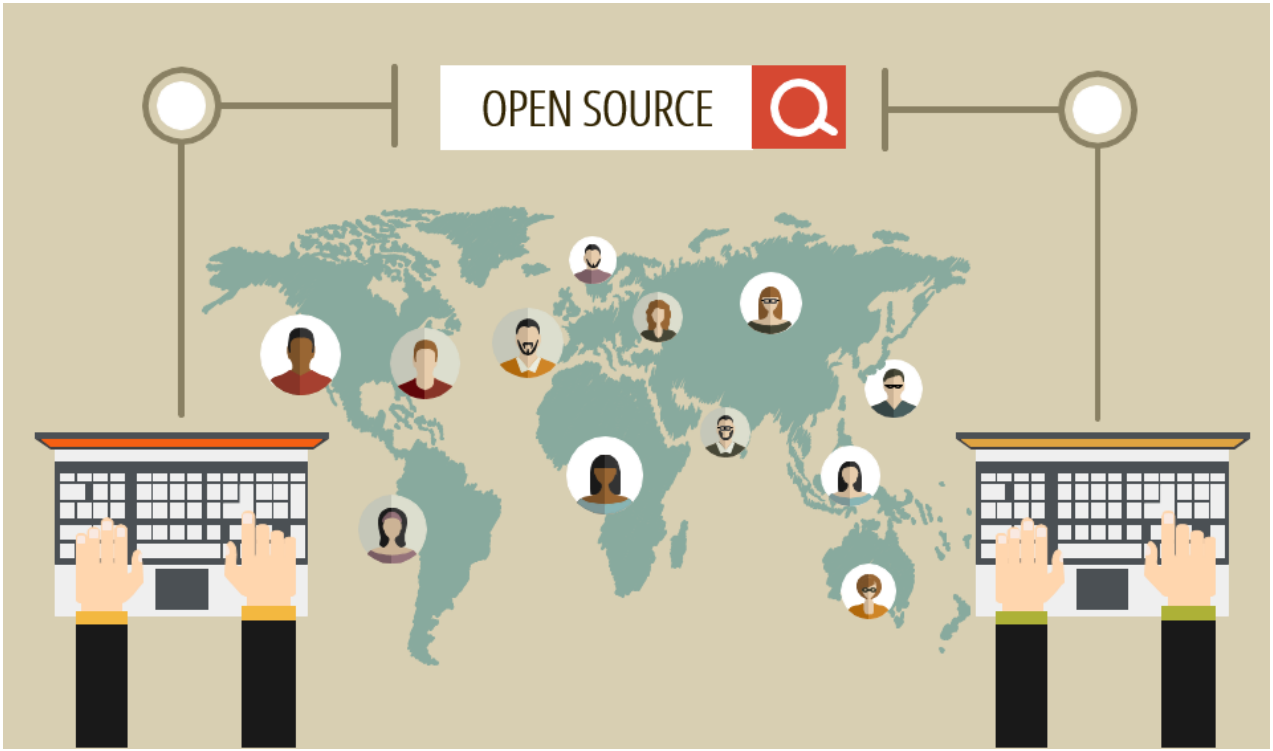

Figure 1: Open Source Project perspective in distributive form.

Open Source Projects used

Ecosystem	Number of Modules/Projects used by students.
Linux Kernel	1
Apache OpenStack	7
OpenStack	8
Odoo	2
Eclipse	4

Table 1: An example table.

Analysis

Modeling

- The number of project (see table 1) considered by students have no consequences on their active contribution or participation of the projects, however, it gives us indications on the degree of freedom, which they can participate on a given ecosystem.
- Student involvement are shown on figure 3, which indicates on the y-axis, the number of semesters and on the x-axis, the varieties of projects that interest students for any given ecosystem.

Team Work

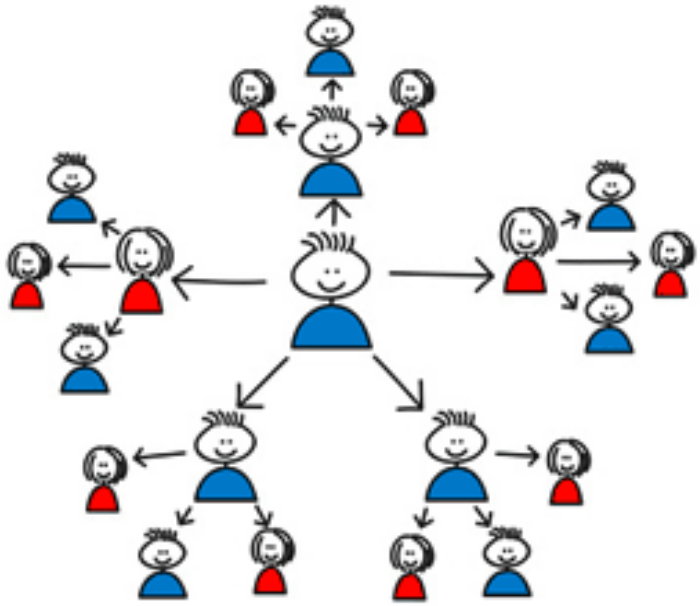

Figure 2: Student collaborating in open source team projects

Analysis

Modeling

- In figure 4, different cloud platforms were introduced to students, and based on the nature of workloads ranging from designing design pattern in the cloud on databases to VM provisioning, and server consolidations, we observe that 93.2% of the students preferred OpenStack over all the other cloud providers.
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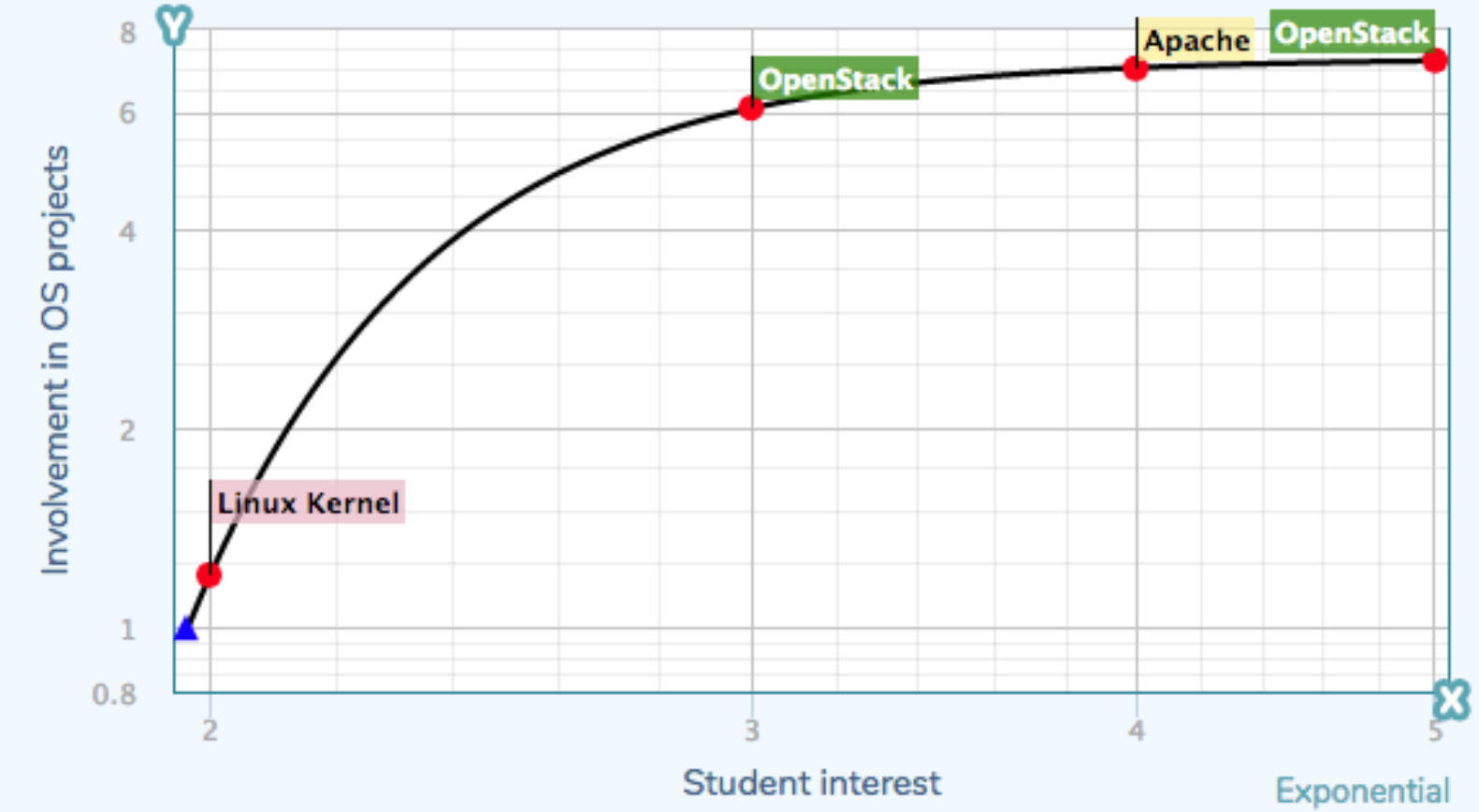


Figure 3: Student involvement on Open Source project per semester.

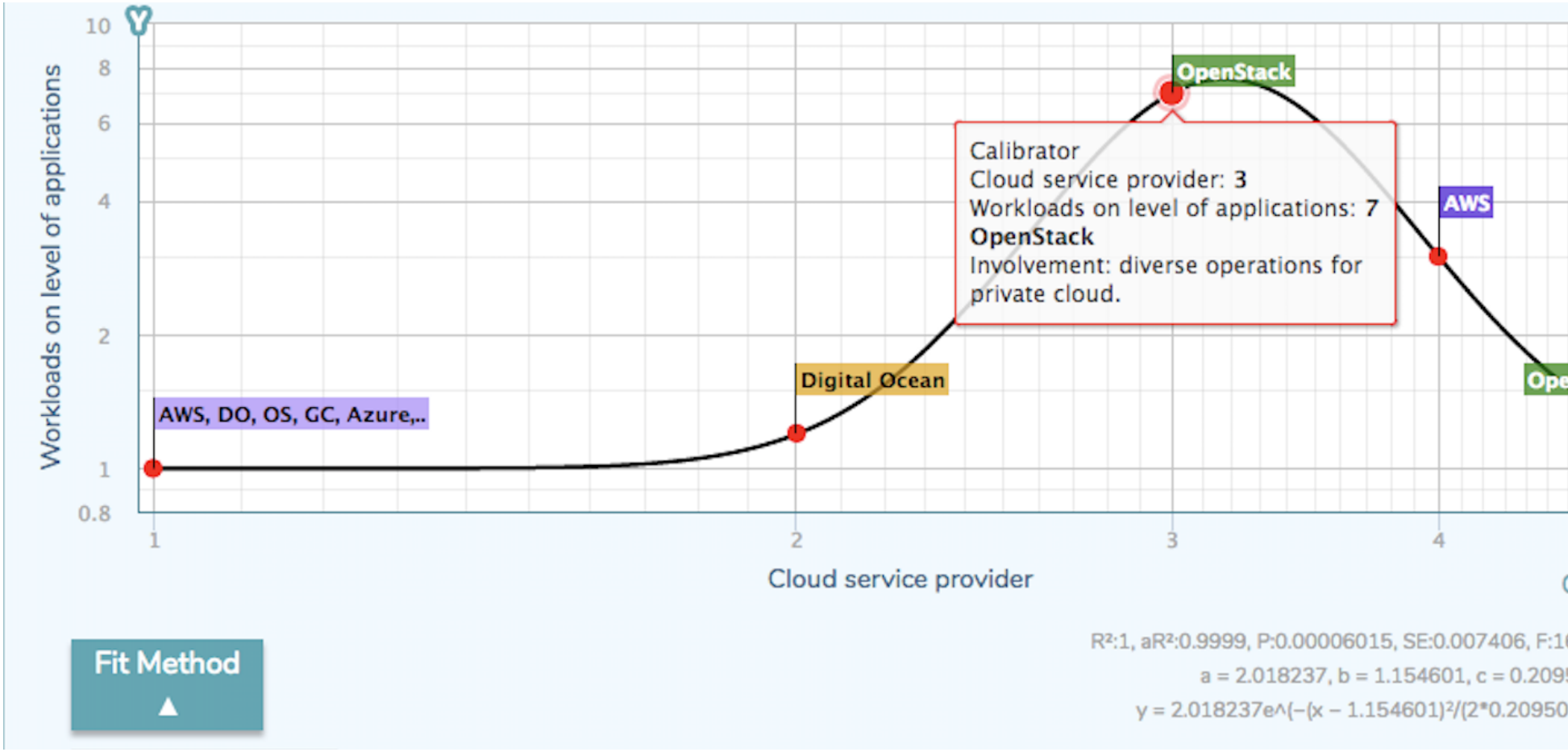


Figure 4: OpenStack cloud is mostly used for varieties of application.

Statistic

To measure the motivational factor, we used two dimensions of motivation [TTF14] we also use a series of questions with each student fills before the start of each semester; a survey and we also study their pre-requisites and performance.

Gender/Semester	Avg. Students	Motivation (Med.)/group
Male	187	0.72
Female	113	0.89

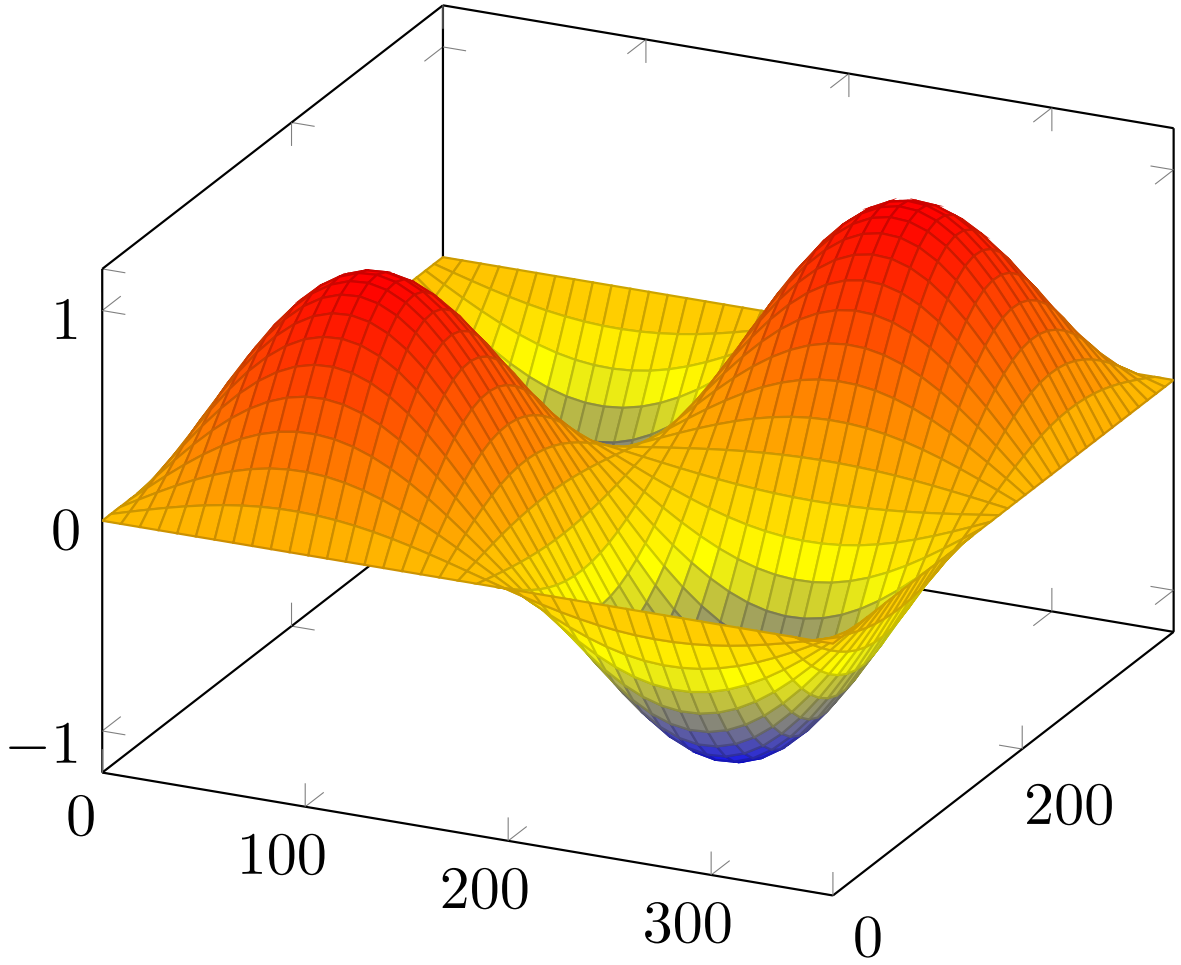
Table 2: Gender motivation on performance per semester.

Early Results on Open source Projects.

- Early findings suggest that, on average, the female students perform better on community project than their male counterparts.
- We also observe that, the time within which the female students spend on resolving issues on the same standard of complexity is lower than their male counterparts.
- On the other hand, we observe that male students are more consistent then their female counterparts;

Mathematical Model

Our Mathematical model shows how we can predict students' performance in contribution to open source project – OpenStack.



Recomendation system

- We are currently analyzing the mathematical model and recommendation system, which will be available by the end of this month. This will also contain our detail results and figures.

- To validate our approach, we tested out hypothesis on three schools within Canada and results were consistent.

References I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